

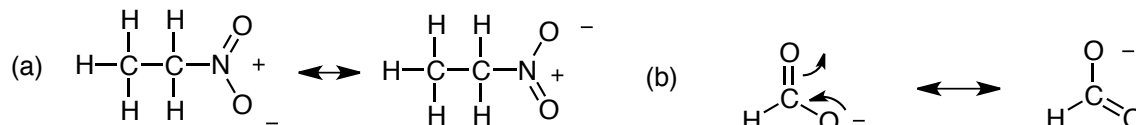
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ANSWER KEY

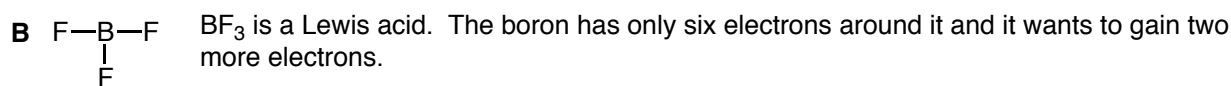
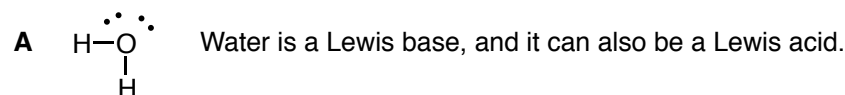
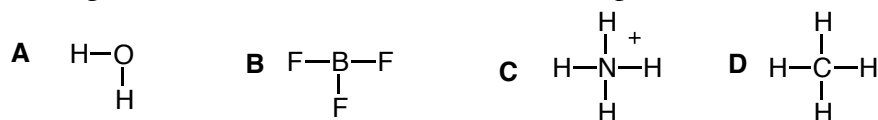
Chem. 121, Sect 009, Quiz 1

Fall, 2012, 50 points

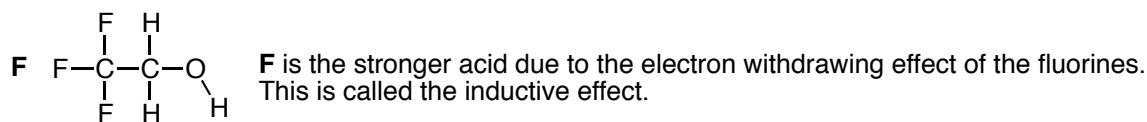
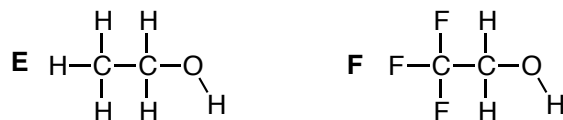
1. Write Lewis structures for the following compounds. Assign formal charges, if any, to the correct atom(s). Show all unpaired electrons and also show all possible resonance structures. (10 pts.) (a)  $C_2H_5NO_2^-$  (b)  $HCO_2^-$  (10 pts)



2. One of the following molecules is (a) Lewis base (b) Lewis Acid. Indicate which is which by circling the Lewis acid and the Lewis base. (10 pts)



3. Which of the following is a stronger acid? Explain briefly. (5 pts)



4. One student tried to synthesize urea (m.p.  $133-134^\circ C$ ) in the lab. She got a white solid with an m.p. of  $121-128^\circ C$ . She was not sure that she had the correct compound. (a) Was her compound a pure substance? Explain briefly. (b) How could she prove with certainty that her compound is the correct one? Explain briefly. (10 pts)

(a) Her compound was not very pure since it had a broad melting point. (b) In order to determine whether or not her compound was indeed urea, she could do a mixed melting point, mixing her compound with a known sample of urea and re-taking the melting point. If the melting point of the mixture does not change, then her compound is indeed urea.

5. In Lab 2, the Separation of an Unknown Mixture, one student had the unknowns shown below.

(a) Which compound(s) was extracted in step 1 when the solution of the three unknowns was treated with sodium bicarbonate ( $Na^+ HCO_3^-$ ,  $pK_aH$  6.2)? Show the reaction that occurred. (b) Which compound was extracted with sodium hydroxide ( $NaOH$ ,  $pK_aH$  15.7). Show the reaction that occurred. (c) Which compound was extracted when the solution was treated with aqueous hydrochloric acid? Show the reaction that occurred. (15 pts)

Name.....

